

Conservative Management of CKD

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Agenda

- **Diagnosis**
- **Measures to slow progression**
- **Estimate Progression**
- **Evaluation and Treatment of Complications**
- **Preparation for Renal Replacement Therapy**
- **What about stem cell therapy and herbals?**

Slowing the Progression of CKD

- Protein Restriction
- Reducing Intraglomerular Hypertension
- Reducing Proteinuria
- Control of Blood pressure.
- Treatment of ppt factors if possible

Protein Restriction

- Dietary protein restriction may protect against the progression of CKD by hemodynamically mediated reductions in intraglomerular pressure and by changes in cytokine expression and matrix synthesis.) The hemodynamic effects of protein-induced hyperfiltration may be due to changes in hormones (such as glucagon and insulin-like growth factor-1), alterations in renin-angiotensin system, and intrarenal effects, including tubuloglomerular feedback.

Protein Restriction

- **Benefits (conflicts)**
- **Limits (0.3, 0.6-0.75 or 1 g/kg of BW/d)**
- **Recommendations**
- **Keto analogues a.a.**

Recommended dietary intake for chronic kidney and end-stage renal disease patients

	CKD	CHD
Protein	0.8 to 1.0 g/kg/day of high biological value protein	>1.2 to 1.3 g/kg/day
Energy	≥35 kcal/kg/day; if the body weight is greater than 120 percent of normal or the patient is greater than 60 years of age a lower amount may be prescribed	
Fat, percent of total energy intake	30 to 40	30 to 40
Polyunsaturated-to-saturated ratio (fatty acid ratio)	1.0:1.0	1.0:1.0
Carbohydrate	Balance of nonprotein calories	
Total fiber, g/day	20 to 25	20 to 25

Recommended dietary intake for chronic kidney and end-stage renal disease patients

Minerals, range of intake		
Sodium, mg/day	<2000	<2000
Potassium, meq/day	40 to 70	40 to 70
Phosphorus, mg/day	600 to 800	600 to 800
Calcium, mg/day	1400 to 1600	1400 to 1600
Magnesium, mg/day	200 to 300	200 to 300
Iron, mg/day	≥10 to 18	≥10 to 18
Zinc, mg/day	15	15
Water, mL/day	Up to 3000 as tolerated	Usually 750 to 1500

Recommended vitamin intake for patients with chronic kidney and end-stage renal disease

Vitamins	Chronic kidney disease	Maintenance hemodialysis
	Diets to be supplemented with the following quantities	
Thiamin, mg/day	1.5	1.1-1.2
Riboflavin, mg/day	1.8	1.1-1.3
Pantothenic acid, mg/day	5	5
Niacin, mg/day	20	14-16
Pyridoxine, mg/day	5	10
Vitamin B12, µg/day	3	2.4
Vitamin C, mg/day	60	75-90
Folic acid mg, day	1	1
Vitamin A	No addition	No addition
Vitamin D	•	•
Vitamin E, IU/day	15	400-800
Vitamin K	None	None

Reducing Intraglomerular Hypertension & Proteinuria

- Increased intraglomerular filtration pressure & glomerular hypertrophy - a response to loss of nephron number
- It promotes ongoing decline of kidney function even if the inciting process has been treated.
- ACEI & ARBs
- Inhibit angiotensin induced vasoconstriction of efferent arteriole
- Reduces intraglomerular filtration pressure and proteinuria

Reducing Intraglomerular Hypertension & Proteinuria

- **If monotherapy is not effective , combined therapy with both ACEI & ARB can be tried**
- **2nd line drugs : Calcium Channel Blockers**
Diltiazem , Verapamil
- **Especially - Diabetic Nephropathy & Glomerular diseases**

Control of Blood Pressure

- **Control of BP : to slow progression of CKD**

to prevent CVS complications and stroke.

- **Goal : BP < 130 / 80 mm Hg**

BP < 125 / 75 mm Hg (DM / Proteinuria > 1g/day)

Control of Blood Pressure

- **Salt Restriction**
- **Diuretics**
- **Loop Diuretics : Furosemide 40 mg BD**
- **Bumetanide 1mg BD**
- **Thiazides : less efficacy if GFR < 30 – 40 ml/min**
- **Both ameliorate hyperkalemia seen with ACEI / ARB**
- **ACEI / ARB**
 - **Check S.Creat & S.K+ within 1 -2 weeks**
 - **Upto 30 % increase in creatinine is acceptable**
- **Beta blockers / CCB / Alpha blockers / Vasodilators**

Estimate Progression

Continuing assessment of the chronic kidney disease patient
Kidney Function
Has kidney function declined?
Has kidney function declined at the predicted rate?
If not, are there exacerbating factors?
Should dialysis be started?
Are there life-threatening complications? Pericarditis Fluid overload Resistant hypertension Hyperkalemia Uncompensated metabolic acidosis
Should access be created or transplantation planned?
Supportive Treatment
Can salt, potassium, and fluid balance be improved by diet or diuretics?
Is the phosphate controlled?
Is the dose of vitamin D compound appropriate?
Should erythropoietin be prescribed?
Are nutritional supplements needed?
Does the patient need counseling?

Figure 70.6 Continuing assessment of the patient with chronic kidney disease (CKD). Questions to be posed when reviewing the patient.

Evaluation & Treatment of Complications

- **Anemia**
- **Bone Disorders**
- **Dyslipidemia**
- **Cardiovascular disease**

Preparation for Renal Replacement Therapy

- **Patients of CKD Stage IV approaching Stage V should be referred for**
- **Vascular access if hemodialysis is preferred**
- **Peritoneal dialysis catheter placement if peritoneal dialysis is preferred**

- **AVF is most preferred access for HD patients**
- **Ideally created 6 months prior to start of HD**
- **Non dominant upper extremity**
- **And that arm is to be preserved – no iv lines**

- **AVG : 3-6 weeks prior to start of HD**
- **PD Catheter : 2 weeks prior to start of HD**

Look for reversibility !

Causes of acute-on-chronic kidney failure	
Dehydration	
Drugs	
Disease relapse	
Disease acceleration	
Infection	
Obstruction	
Hypercalcemia	
Hypertension	
Heart failure	
Interstitial nephritis	

Figure 70.5 Causes of acute-on-chronic kidney failure.

- **What about :**

- **Stem Cell Therapy?**

- **Herbals?**

THANKS